

***IN THE UNITED STATES PATENT AND TRADEMARK OFFICE***

Applicant: Fabio GIANETTI et al.  
Title: METHOD AND DEVICE FOR DELIVERING DATA  
Appl. No.: Unassigned  
Filing Date: September 24, 2003  
Examiner: Unassigned  
Art Unit: Unassigned

**CLAIM FOR CONVENTION PRIORITY**

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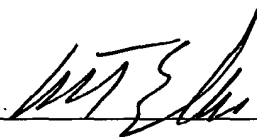
The benefit of the filing date of the following prior foreign application filed in the following foreign country is hereby requested, and the right of priority provided in 35 U.S.C. § 119 is hereby claimed.

In support of this claim, filed herewith is a certified copy of said original foreign application:

- GREAT BRITAIN Patent Application No. 0222217.2 filed 09/24/2002.

Respectfully submitted,

Date 9/24/03

By 

Hewlett-Packard Company  
Customer Number: 22879  
Intellectual Property Administration  
P.O. Box 272400  
Fort Collins, Colorado 80527-2400

William T. Ellis  
Attorney for Applicant  
Registration No. 26,874





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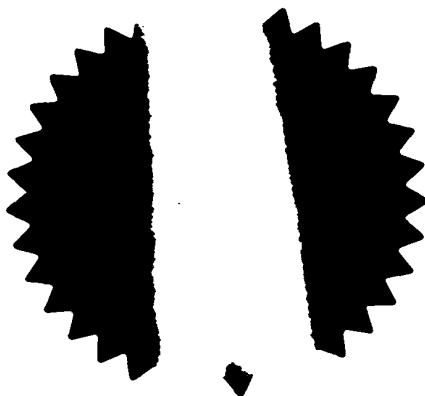
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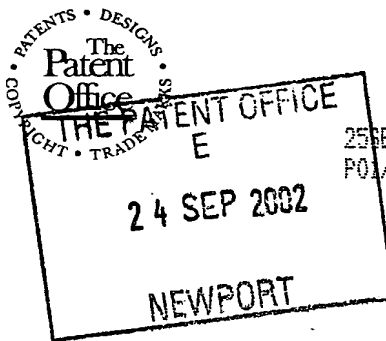
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Palo Alto  
CA 94304, USA

Patents ADP number (*if you know it*)

Delaware, USA

496588001

If the applicant is a corporate body, give the country/state of its incorporation

4. Title of the invention Improvements relating to data delivery

5. Name of your agent (*if you have one*)

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Richard A Lawrence  
Hewlett-Packard Ltd, IP Section  
Filton Road, Stoke Gifford  
Bristol BS34 8QZ

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Date

Richard Anthony Lawrence 24 Sept 02

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## IMPROVEMENTS RELATING TO DATA DELIVERY

- 5 This invention relates to a method and related apparatus for delivering data to one or more computing devices and in particular relates to a such a method and apparatus for delivery of the data to a remote computing device such as via a network such as the Internet.
- 10 Access to web pages on the World Wide Web (WWW) is one example of prior art for this invention and it is currently possible to gain access to a web page using a number of different devices, such as a desktop or laptop computer, a personal digital assistant (PDA), a web enabled television or directly to a mobile telephone. Thus, in principle, data posted on a web
- 15 page, such as text and graphics is accessible by a consumer in possession of any one of these devices who is able also to avail themselves of the requisite network links. In practice however a significant (but to the lay person apparently trivial) difficulty exists in disseminating data to all of these devices in a manner which is useable by a consumer: the device the
- 20 consumer is using to make manifest the data may not be capable of manifesting elements of the data essential for comprehension of the information within it. Specifically for example a web page may not have been authored specially to enable viewing of its data on devices with low a capability such as a mobile telephone display (which are generally small
- 25 monochrome and low resolution screen). If the author of the web page has therefore created the web page so that all or part of the essential information on the page required by the user is "coded" in the form of photographs, coloured text or animations and the like, then a user who is unable to fully display these elements of the data on their screen may
- 30 effectively be unable to access the web page in any meaningful manner.

This problem is known, and is currently addressed in a number of different manners. According to one approach, data for a web page (for example) is authored independently of a consideration of the device on which the data is to be handled, other than perhaps to the extent that the author attempts to encode all important information in a manner which even the crudest form of device can handle. Once a request for a copy of the web page is received, an adaptation process, performed by a program which intermediates between the device which is to receive the data and the host device where the data is stored then takes place, in which an abridged version of the data appropriate to the device to which data is to be sent is extracted from the original data for the web page in question, and is sent to the receiving device.

A second approach involves authoring the page using computer code to author the data which is specifically appropriate for a particular class of requesting device (for example using hyper-text markup language Html) to author web pages for consumption by conventional desktop or laptop computers, which may mean having to author the page several times in order to enable manifestation of the page on several differing classes of device. In what may be termed a sub-class of this approach, data authored in a language specifically appropriate for one device is transformed into a language specifically appropriate to another class of device, possibly resulting in an unwanted loss or alteration of data as a result (in a manner analogous to the result of translating, for example, a German document into English using computer software).

The present invention tries to overcome or at least reduce the problems of the prior art.

According to a first aspect of the invention there is provided a method of delivering data to any of two or more data-handling devices having



different data handling capabilities, the method comprising the steps of:

i: structuring an initial portion of the data to provide at least a preferred and an alternative version of the initial portion of the data, each version suitable to make the data suitable for handling by at least one of the at least two data-handling devices;

ii: storing the versions of the initial portion of the data; and

iii: upon receipt of a request for data, adapting one of the preferred or alternative version of the initial portion of the data by augmenting the data with dynamically generated data and delivering the initial portion of the data augmented with the dynamically generated data to at least one data-handling device.

Such a method is advantageous because it may provide a mechanism that allows a layout to be tailored to data of differing lengths, unknown nature at the time of creation of the initial portion of the data, or other similar situations. The preferred and alternative layouts may be tailored to data having different lengths, etc. and having at least two different versions of the initial portion of the data may provide flexibility in how the initial portion of the data can incorporate the dynamically generated data. A further advantage of the method is that it may allow an author to arrange the initial versions such that the data augments as desired with the dynamic data.

In some embodiments, the preferred version of the initial data may be initially augmented with the dynamic data and sent to the data-handling device. If an error message is received from the data-handling device that it could not handle this data the method may then augment an alternative version of the initial portion of the data with the dynamic data and send this to the data-handling device.

30

In alternative, or additional embodiments, the method may determine

which of the versions of the initial portion of the data should be augmented with the dynamic data before augmentation takes place. Such embodiments may use a model of the dynamic data to determine which of the versions should be used. Such a method may prove more efficient  
5 than embodiments which iterate towards the correct version and as such may be more advantageous.

Advantageously, the method may ensure that there is at least a single version of the initial portion of the data provided for each of the data-  
10 handling devices to which data may sent which when augmented with the dynamic data allows that data to be handled by the data-handling device.

According to a second aspect of the invention there is provided a computing device capable of delivering data to any of two or more data-  
15 handling devices having different data handling capabilities, the computing device comprising a receiving means for receiving a request for data, a transmitting means arranged to transmit data, a processing means arranged to process data and a storage means for storing data said storage means being arranged to hold at least an initial portion of the data  
20 as a preferred and an alternative version, and further the device being arranged such that when the receiving means receives a request for data the processing means is arranged to augment one of the preferred or alternative version of the initial portion of the data with dynamically generated data and send the initial data augmented with the dynamic data  
25 to the transmitting means which is arranged to transmit said initial portion of the data augmented with the dynamic data to a data-handling device.

According to a third aspect of the invention there is provided a network arranged to be capable of delivering data to any of two or more data-  
30 handling devices having different data handling capabilities, the network comprising a receiving means for receiving a request for data, a

## 5

transmitting means arranged to transmit data, a processing means arranged to process data and a storage means for storing data, said storage means being arranged to hold at least an initial portion of the data as a preferred and an alternative version and further the network being  
5 arranged such that when the receiving means receives a request for data the processing means is arranged to augment one of the preferred or alternative versions of the initial data with dynamically generated data and send the initial data augmented with the dynamic data to the transmitting means which is arranged to transmit said initial portion of the  
10 data augmented with the dynamic data to a data-handling device.

According to a fourth aspect of the invention there is provided a data-handling device capable of communicating with a computing device and/or network and receiving data therefrom, the data-handling device  
15 being arranged to communicate a parameter such that a method according to the first aspect of the invention can be applied to the data that is sent to the data-handling device.

The parameter may be any one of the following: the identity of the  
20 device, the model of the device, the data-handling capabilities of the device.

According to a fifth aspect of the invention there is provided a machine-readable medium containing instructions which when read by a computing  
25 device cause that computing device substantially to perform the method of the first aspect of the invention.

According to a sixth aspect of the invention there is provided a machine-readable medium containing instructions which when read by a computing  
30 device cause that computing device to function substantially as the computing device of the second aspect of the invention.

According to a seventh aspect of the invention there is provided a machine-readable medium containing instructions which when read by a computing device of a network cause that network to function  
5 substantially according to the third aspect of the invention.

According to an eighth aspect of the invention there is provided a machine-readable medium containing instruction which when read by a data-handling device cause that data-handling device to function  
10 substantially as the data-handling device according to the fourth aspect of the invention.

The machine-readable medium of any of the aspects of the invention may be any one or more of the following: a floppy disk; a CDROM; a DVD  
15 ROM / RAM (including +RW/-RW); a hard drive; memory; any form of magneto optical disk; any form of tape; a transmitted signal (which may an Internet download, a ftp transfer, or any other transmitted signal); a wire.

20 According to a ninth aspect of the present invention there is provided a method of disseminating media data, hosted at a site within an information technology network, to one of a plurality of different classes of device connected to the network, the different classes of device having different capabilities for manifesting the data, the method comprising the  
25 steps of:

i: authoring the data by at least structuring the data in a manner which is independent of device on which the data is to be manifested;

30 ii: adapting the authored data to generate at least a preferred and an alternative adapted version of the authored data to make the data

suitable for manifestation on a given class of device;

iii: storing the adapted data at a location within the network; and

5        iv: upon receipt of a request for a copy of the data, augmenting at least one of the versions of the adapted data with dynamic data and delivering the adapted data augment with the dynamically generated data to at least one data-handling device.

10      There now follows by way of example only a detailed description of one embodiment of the present invention with reference to the accompanying drawings of which:

Figure 1 schematically shows the architecture of a server for this  
15      invention;

Figure 2 schematically shows a number of data-handling devices having data connections to the server of Figure 1;

20      Figure 3 schematically shows the processes provided by this invention;

Figure 4 shows a flow chart outlining the processes being provided;

Figure 5 shows the effect of the processes of Figure 3 on data provided  
25      thereto; and

Figure 6 to 8 show the processes of Figure 3 in greater detail.

This particular invention is applicable to delivering data electronically,  
30      and in particular web content via the World Wide Web, or in short the web, although the invention does have wider application. Generally the

data to be delivered is held on, or accessible by, a processing apparatus, or server 100, as shown in Figure 1, and can be requested by any number of devices that are capable of communicating with the server 100. The data does not necessarily have to be sent to the device that requested the  
5 device and one device may request that data can be sent to another device.

In this embodiment the computing device, or server 100, comprises a display 104, processing circuitry 106, a keyboard 108, and mouse 110.  
10 The processing circuitry 106 further comprises a processing unit 112, a hard drive array 114, a video driver 116, memory 118 (RAM and ROM) and an I/O subsystem 120 which all communicate with one another, as is known in the art, via a system bus 122. The processing unit 112 comprises an INTEL™ PENTIUM™ series processor, running at typically  
15 between 2GHz and 2.5GHz. The server 100 connects to a network via a network adapter 124, which provides a transmitting and receiving means for the server 100 and allows communication with the server 100 across a network to which the server 100 is attached.

20 It will be appreciated that although the computing device 100 is described as a server connected to a network it would be equally possible for the computing device to be un-networked and for transmission of data from the computing device 100 to occur over a direct connection to that computing device. The direct connection may be any form of connection  
25 suitable for transmitting data whether wireless or wired.

As is known in the art the ROM portion of the memory 118 contains the Basic Input Output System (BIOS) that controls basic hardware functionality. The RAM portion of memory 118 is a volatile memory  
30 used to hold instructions that are being executed, such as program code, etc. The hard drive array 114 is used as mass storage for programs and

other data although it is of course equally possible for data to be accessed across the network via the network adapter 124 from a remote storage means.

- 5 Other devices such as CDROMS, DVD ROMs, etc. could be coupled to the system bus 122 and allow for retrieval and/or storage of data from different media, etc.

The server 100 could have the architecture known as a PC, originally  
10 based on the IBM™ specification, but could equally have other architectures. The server may be an APPLE™, or may be a RISC system, and may run a variety of operating systems (perhaps HP-UX, LINUX, UNIX, MICROSOFT™ NT, AIX™, or the like).

- 15 In this embodiment web content, in this case a web-site comprising a number of pages, is held on the server 100. The web content is visual information comprising text, graphics, etc. It will be appreciated that the data could also comprise sound or any other data that it may be desired to transmit.

20

- It will be appreciated that a web-site may include static data (that is, data which is known at the time of authoring and does not vary with time) and dynamic data which may not be known with certainty until the web-site is accessed and viewed by a user which may be due to a number of different  
25 reasons. For example, the data may be time dependent in some manner, it may be specific to the location of the user (for example weather information), it may be dependent upon the identity of the user (for example bank account details), or other similar situations. By way of example, a web-site providing weather forecasts may have headings and  
30 links that remain the same from day to day, whereas the weather forecasts themselves will vary. Alternatively, the web-site may display some

information that the user calls to the screen- for instance the user may be accessing a database of names and addresses. While it can usually be expected that a name will be under, say, 50 characters longs, this cannot be guaranteed. In the case of sound data the static data may, for example, comprise a heading announcing the data to follow (e.g. the static data may announce "telephone number" and the dynamic data may be the telephone number that has been requested.)

As a further example in which the data of the web page in the form of text (i.e. visual characters, usually alpha-numeric in any language), a web page may provide information on train times, and the opportunity to book a ticket. The data however could be in any media form consumable via the network, such as music, graphics, moving images such as film or video clips, or animations, or a book assimilable in tactile form via the network, for example in Braille, sound or any other data.

Referring now to Figure 1 computing device 100 within a network hosts a web page which can be accessed across the network, and a processing capability which runs a program for adapting the data of web pages to devices to which the pages may be sent. In the present example this is provided by the processor 112 of the entity hosting the web page although this is not essential and the processing capability may be provided by any suitable computing entity, and at any suitable location within the network.

In the examples to be discussed in detail herein, the data of the web page is provided by an author, although this is not necessary, and is entirely incidental from the point of view of the present invention. In this context the process of authoring the web page may include the provision of a number of the parts which comprise the total data. For example, in the case of a legacy system (i.e. one having pre-existing data) to which the methods of the present invention are to be applied, the data may be



authored simply by translating the pre-existing electronic structure coded into the file storing the data into a more suitable form; authoring of the data may however additionally include other authoring steps, such as actually creating the artistic work, for example.

5

The authored data may be static data as discussed above and provide an initial portion of data. In a perhaps preferred embodiment this initial portion of data may be processed to create at least a preferred version and an alternative version in accordance with various device class specifications to enable it to be appropriately manifested on devices within the aforementioned classes, such as, for example, on a desktop PC 200, on a Personal Digital Assistant (PDA) 202 on a mobile telephone 204, or listened to on a headset 206, as illustrated in the schematic illustration of the process shown in Figure 2. However, in alternative  
15 embodiments alternative and additional embodiments may be provided. Therefore, a preferred and an alternative version is provided for each device class specification. It will be appreciated that each of the devices in Figure 2 has different data handling and indeed different data display/reproduction capabilities. Further, devices in any one particular  
20 class (for example PDA) may have different display capabilities compared with other devices of that class.

Device class specific adaptations of the data are then stored within the network, in the present example on the hard drive array 114, although  
25 this storage may once again be located at any suitable location within the network. The device class specific adaptations are stored in at least a preferred 310 and an alternative 312 version, which are used as will be explained hereinafter. In other embodiments, any number of other versions of the initial data may be generated and stored in a storage  
30 means for future use (perhaps roughly any of the following: 3, 4, 5, 6, 7, 8, 9, 10, 15, 25, 50 or more versions could be created, or any number in

between).

Figure 3 provides an overview of the processes of one embodiment of the present invention and comprises two stages: stage one 300 and stage  
5 two 302. The stage one 300 process takes as its inputs an author specified layout 304, initial / authored (static) data 306 and a model 308 of the dynamic data which may be expected. The first stage process takes these inputs and generates at least a preferred 310 and an alternative version 312 of the initial portion of the data into which dynamic data 314  
10 can be inserted by the second stage of the process 302.

Thus, referring now to Figure 4, in summary, an embodiment of process according to the present invention includes, at step 400 the authoring of the data to provide authored data, which at least includes the process of  
15 incorporating within the data machine-readable structure which is, generally, independent of device specification by which the data is to be handled. The process could of course be applied to authored data that was held in a device specification dependent manner.

20 This step is followed, at step 402, by the process of filtering the data for the particular class of device to which the data is to be handled, so that for example non-essential elements of the data can be omitted in the case of limited capability devices, and at step 404 the filtered data is adapted to the specific class of device. Preferably, when authoring the data, it is  
25 useful to have at least some idea of how the data will be handled as a result of decisions taken during the authoring process.

For the case of data-handling devices that display the data it is advantageous if the adapted data can be viewed and therefore, at step 406  
30 the device-specific adapted data is displayed to provide this information, most preferably in What You See Is What You Get (WYSIWYG) form, so

that it is readily apparent the exact manner in which the data will be displayed. However, it will be appreciated that certain kinds of data, for example audio, cannot be displayed in this manner and other mechanisms may be required to check the adaptation of such data.

5

In this first stage adaptation process 402, 404, 406 two version of the initial data are generated: a preferred and an alternative. In other embodiments it would be equally possible to generate other versions. Generally, each version of the adapted data that has been created is stored  
10 in a separate file. However, it would be equally possible for the version to be stored in another manner - for example as separate portions of a single file with appropriate markings between the files, in a database, or any other suitable means.

15 Following device-specific adaptation, the initial data is stored at a suitable location within the network at step 408, from which it is retrieved and sent to a data-handling device on receipt of a request 409, whereupon it is augmented with the dynamic component of the data at step 412. Initially an attempt is made to augment the dynamic data with  
20 the preferred version of the adapted data and at step 412 an assessment is made as to how well the dynamic data fits within the preferred version of the adapted data as will be explained hereinafter. If the dynamic data does not fit within the preferred version of the adapted data then the process flow loops and an attempt is made to fit the dynamic data to the  
25 next most preferred version of the adapted data.

In alternative versions, it will be possible to assess the dynamic data and determine into which version of the initial portion of the data the dynamic data should be augmented. For example, if the dynamic data were a name  
30 from a database, it would be possible to obtain the number of characters in the name and from this number determine which of the versions

(preferred/alternative) would be most appropriate.

- The versions of the initial data may be arranged such that there is at least one version of the initial data to which the dynamic data will fit and therefore, eventually the process should find a version of the initial portion of the data that is suitable. Thus, for example if versions of the initial data are to be provided for the PDA class of devices, it is desirable to ensure that at least one version of the initial portion of the data allows all dynamic data as specified in the dynamic data model 308 to be displayed on the PDA having the lowest display capability. This should ensure that all of the data may be displayed on all of the devices. Other methods may be used to speed the selection of the appropriate version of the adapted data rather than simply trying one after the other.
- 15 Once a version of the initial portion of the data has been selected into which the dynamic data fits minor adjustments may be made to this combination of the adapted data augmented with the dynamic data in step 414. The minor adjustments may be made as appropriate to take account of minor differences of the requesting device from that of its generic class (for example for a specific model of PDA within the class of PDA's), this process taking place at any suitable location within the network between the storage of the device specific adaptations and the requesting device, including where appropriate at either of these entities. Once any such minor adjustments have been made to the data it is transmitted to the data-handling device for which it is intended in step 416. This may of course, not be the data-handling device that requested the data.

The process of determining whether the dynamic data fits within the initial data is described in relation to Figure 5. Authored data 500 is adapted in the first stage adaptation process 502 which comprises the steps 302, 304 described in relation to Figure 3. This generates at least a

preferred 504 and an alternative 506 version of the authored initial portion of the data. The augmenting process 412 described in relation to Figure 4 tries to fit dynamic data into the one of the versions of the adapted data, starting with the preferred version.

5

Looking at Figure 5 it can be seen that in this example the preferred version 504 of the adapted data includes a table comprising two rows and four columns, whereas the alternative version 506 includes a table comprising four rows and two columns. Using x,y notation with the origin being at the lower left corner of each table, it can be seen that dynamic data is to be fitted to the four of the cells of each version of the table 504, 506. In the preferred embodiment the dynamic data is to be fitted at cells (2,1), (4,1), (2,2) and (4,2) whereas in the alternative version the dynamic data is to be fitted at cells (2,1), (2,2), (2,3) and (2,4). It will be appreciated that the width of the second column in the alternative version 506 is wider than the width of the columns in the preferred embodiment and that therefore the dynamic data is more likely to fit the table. Therefore, as illustrated at 508 in Figure 5 although the dynamic data fits in two of the cells of the preferred versions of the adapted data (cells (2,2) and (4,1)) it does not fit in two other cells ((2,1) and (4,2)). However, as illustrated at 510 in Figure 5 because of the greater column width the dynamic data fits in the alternative version 506 of the adapted data.

25 The dynamic data may be generated from a database, which will be appreciated will generally have a maximum length for any one field. However, the average length of data within that field could potentially be less than the maximum. The preferred embodiment of the adapted data may be arranged to accommodate the average, or perhaps more usefully slightly greater than the average length, of the data within that field such  
30 that it is displayed how the author intends. However, for some of the

records within the database the data may be too long for the preferred version of the adapted data. In such a situation the alternative version may be used which may be arranged so that it can accommodate the longest record within the database. Of course, it would be possible to  
5 have any number of alternative versions. For example the preferred version may be able to accommodate data less than the average length and then iterate through further version until a suitable version is located.

Figures 6 to 8 show an example implementation in which the web-page  
10 shows a product code and a description of varying length. Figure 7 shows the case when the description is of a length such that the preferred layout can be used in presenting the information. Figure 8 shows the case where the description is too long to be shown in the preferred layout and the fallback layout is used in its place. As Figures 6 to 8 correspond to  
15 Figure 3, like features are labeled with like reference numerals.

Discussing these Figures in greater detail, Figure 6 shows an example of a Stage 1 adaptation 300. In Figure 6, a Stage 1 Adaptor 601 receives static content, or authored initial portion of the data 306 with the Author  
20 specified layout 304 of a 2x2 table, intended to display a product code and a description of the product associated with that code, and a title. The dynamic content model 308 states that the dynamic content will be drawn from a data source such that the product codes to be accessed will have a maximum of 5 characters, while the descriptions associated with  
25 that product may have up to 80 characters.

In the Stage 1 Adaptation 300, the Stage 1 Adaptor 601 creates two layouts, a preferred layout 310, in this example comprising a 2x2 table with a title and a fallback, or alternative layout 312, comprising a 1x4  
30 table with a title. It also establishes that for a particular device class, the preferred layout 310 can be used provided that the description associated

with a product code referenced when displaying the web site is less than 40 characters long. If the description exceeds 40 characters, then the alternative layout 312 should be used.

- 5 Figure 6 also shows an extract 603 from the database holding the product codes and the associated descriptions. As can be seen from this extract 603, some of the descriptions are less than 40 characters long, some exceed 40 characters.
- 10 Figure 7 shows the Stage 2 Adaptation 302 that is performed when the description associated with a product code accessed by a user of web-site is less than 40 characters long, i.e. when the preferred layout may be used.
- 15 The device 702 (which may be any of the example devices 200, 202, 204, 206 discussed above) sends a request 704 to a Stage 2 Adaptor 706 for information relating to the product with product code 0002. This has a description 34 characters long, so the Stage 2 Adaptor augments 707 the preferred layout 310 with the dynamic data, in
- 20 this case comprising the product code and the product description. The completed layout 708 is then sent 710 to the device 702.

Figure 8 shows the Stage 2 Adaptation 302 that is performed when the description associated with a product code accessed by a user of web-site

25 exceeds 40 characters, i.e. when the preferred layout may no longer be used and the alternative layout 312 should be used in its place.

The device 702 (which may be any of the example devices 200, 202, 204, 206 discussed above) sends a request 704 to a

30 Stage 2 Adaptor 706 for information relating to the product with product code 0003. This has a description 73 characters long, so the Stage 2

18

Adaptor 706 augments the alternative layout 312 with the dynamic data, again comprising the product code and the product description. The completed layout 802 is then sent 710 to the device 702.



## CLAIMS

1. A method of delivering data to any of two or more data-handling  
5 devices having different data handling capabilities, the method comprising  
the steps of:
  - i: structuring an initial portion of the data to provide at least a  
preferred and an alternative version of the initial portion of the data, each  
version suitable to make the data suitable for handling by at least one of  
10 the at least two data-handling devices;
  - ii: storing the versions of the initial portions of the data; and
  - iii: upon receipt of a request for data, adapting one of the preferred  
or alternative version of the initial portions of the data by augmenting the  
initial portion of the data with dynamically generated data and delivering  
15 the initial portion of the data augmented with the dynamically generated  
data to at least one data-handling device.
2. A method according to Claim 1 which further comprises an initial  
step of authoring and storing the initial portion of the data and processing  
20 this stored initial portion to generate the at least the preferred and  
alternative versions of the initial portion of data.
3. A method according to Claims 1 or 2 in which the dynamic data is  
generated from any one or more of the following: a database; a newsfeed;  
25 any suitable store of machine-readable data.
4. A method according to any of Claims 1 to 3 in which the method  
determines with which version of the initial portion of the data the  
dynamically generated data fits most appropriately and augments that  
30 version with the dynamic data.

5. A method according to any preceding Claim which uses a model of the dynamic data in order to generate the versions of the initial portion of the data.

- 5 6. A method according to any preceding Claim which ensures that there is at least one version of the initial portion of the data that is suitable to augment with the dynamic data to create data that is suitable to send to a data-handling device having the lowest capabilities that can receive data.

10

7. A computing device capable of delivering data any of to two or more data-handling devices having different data handling capabilities, the computing device comprising a receiving means for receiving a request for data, a transmitting means arranged to transmit data, a  
15 processing means arranged to process data and a storage means for storing data said storage means being arranged to hold at least an initial portion of the data as a preferred and an alternative version, and further the device being arranged such that when the receiving means receives a request for data the processing means is arranged to augment one of the  
20 preferred or alternative version of the initial portion of the data with dynamically generated data and send the initial portion of the data augmented with the dynamic data to the transmitting means which is arranged to transmit said initial portion of the data augmented with the dynamic data to a data-handling device.

25

8. A network arranged to be capable of delivering data to any of two or more data-handling devices having different data handling capabilities, the network comprising a receiving means for receiving a request for data, a transmitting means arranged to transmit data, a processing means  
30 arranged to process data and a storage means for storing data, said storage means being arranged to hold at least an initial portion of the data

as a preferred and an alternative version and further the network being arranged such that when the receiving means receives a request for data the processing means is arranged to augment one of the preferred or alternative versions of the initial portion of the data with dynamically  
5 generated data and send the initial portion of the data augmented with the dynamic data to the transmitting means which is arranged to transmit said initial portion of the data augmented with the dynamic data to a data-handling device.

10 9. A data-handling device capable of communicating with a computing device and/or network and receiving data therefrom, the data-handling device being arranged to communicate a parameter such that a method according to any of Claims 1 to 6 can be applied to the data that is sent to the data-handling device.

15 10. A machine-readable medium containing instructions which when read by a computing device cause that computing device substantially to perform the method any of Claims 1 to 6.

20 11. A machine-readable medium containing instructions which when read by a computing device cause that computing device to function substantially as the computing device of Claim 7.

25 12. A machine-readable medium containing instructions which when read by a computing device of a network cause that network to function substantially according to Claim 8.

30 13. A machine-readable medium containing instruction which when read by a data-handling device cause that data-handling device to function substantially as the data-handling device according Claim 9.

## ABSTRACT

### 5 IMPROVEMENTS RELATING TO DATA DELIVERY

A method of delivering data stored within a network to two or more data-handling devices (200, 202, 204, 206) having different data handling capabilities, the method comprising the steps of authoring the data (400)  
10 to produce authored data and storing it in at least one location within the network, generating adapted data by adapting the authored data by at least structuring the authored data to provide at least a preferred (310) and an alternative (312) version of the adapted data, each version (310, 312) suitable to make the data suitable for handling by at  
15 least one of the at least two data-handling devices (200, 202, 204, 206), storing the adapted data (408) at a location within the network and upon receipt of a request for the data (409), augmenting (302) one of the preferred (310) or alternative (312) versions of the adapted data with dynamically generated data (314) and delivering (416) the adapted data  
20 augmented with the dynamically generated data (314) to at least one data-handling device (200, 202, 204, 206).

To be accompanied, when published, by Figure 3 of the drawings.

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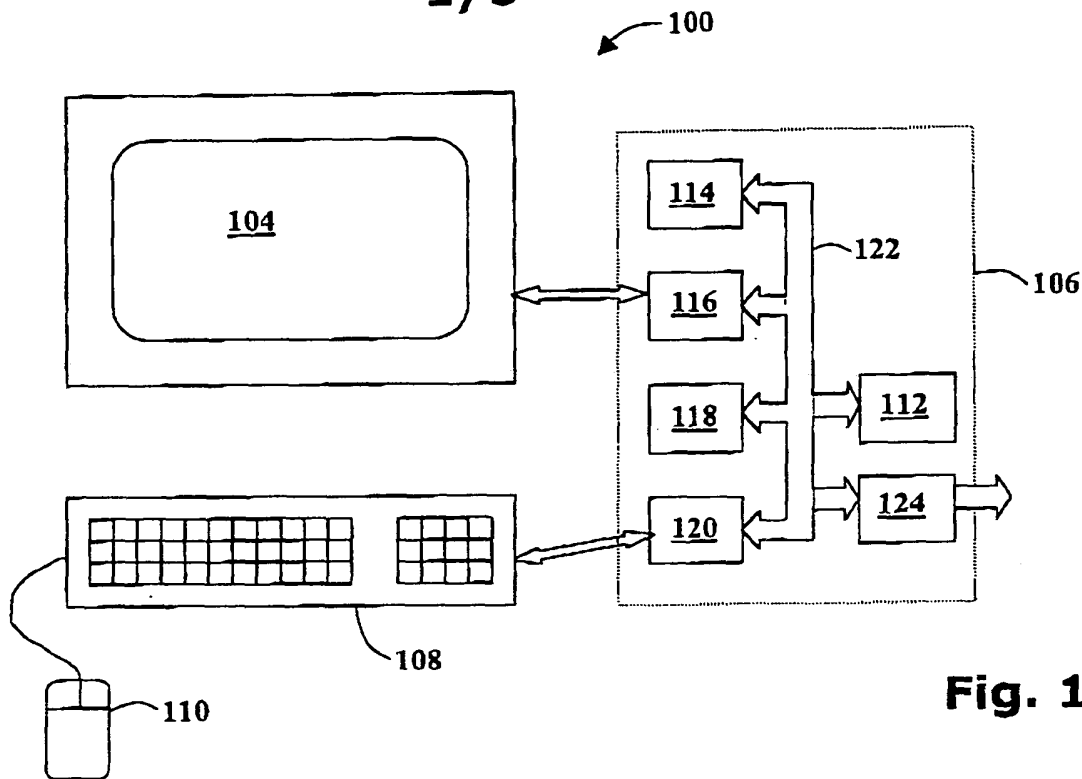


Fig. 1

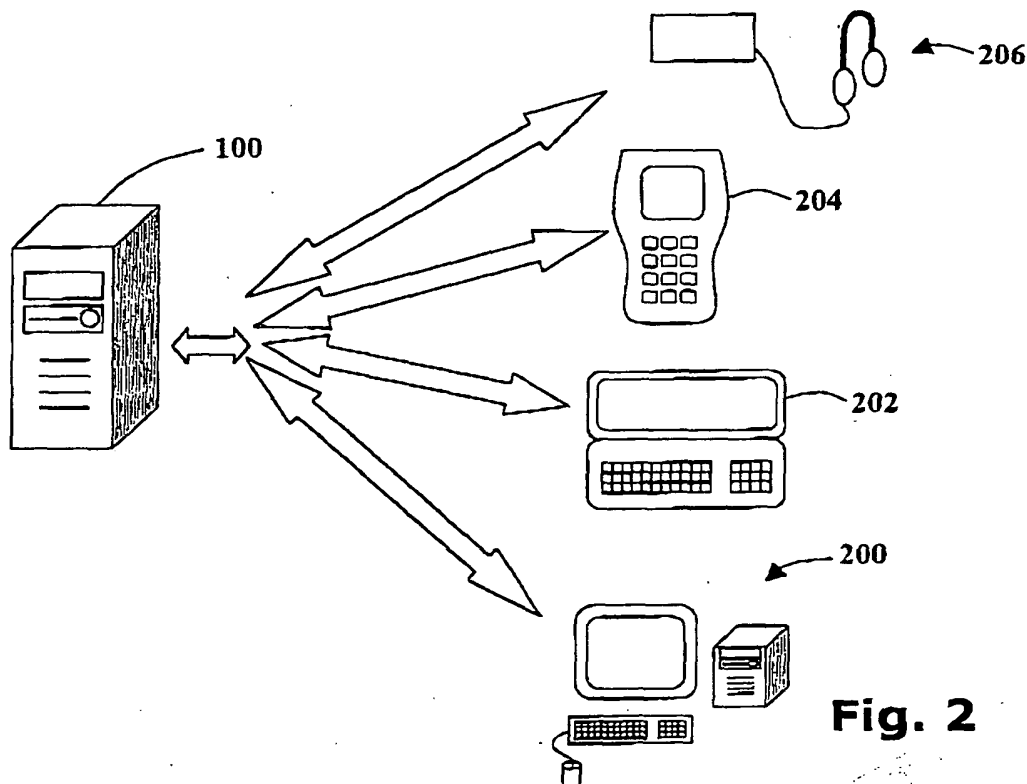
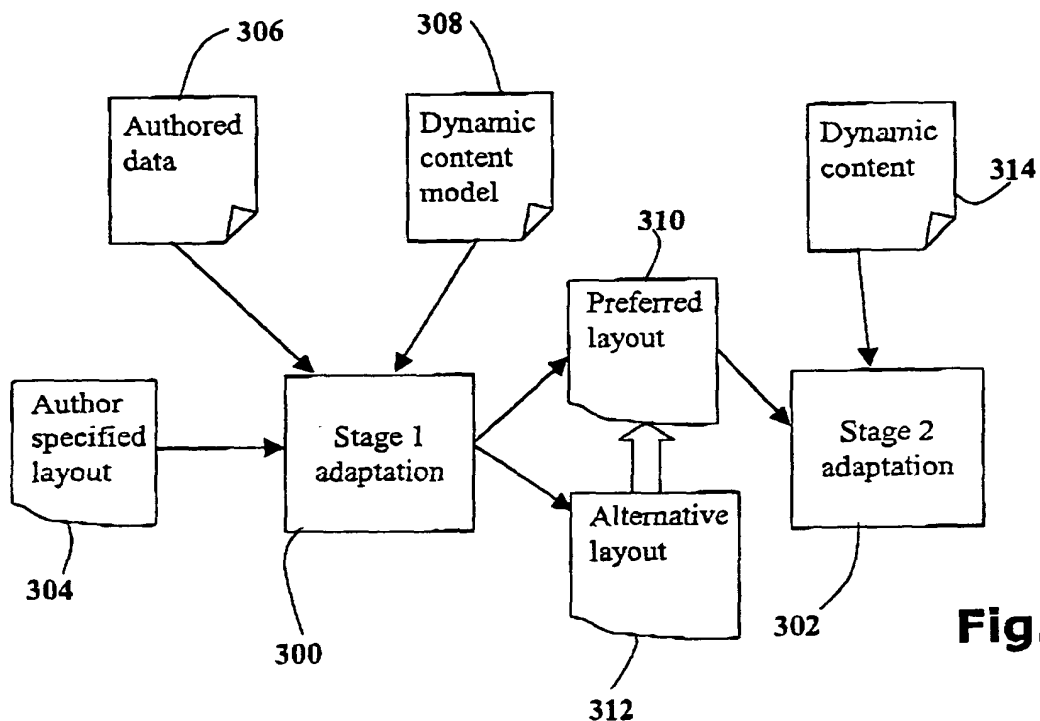


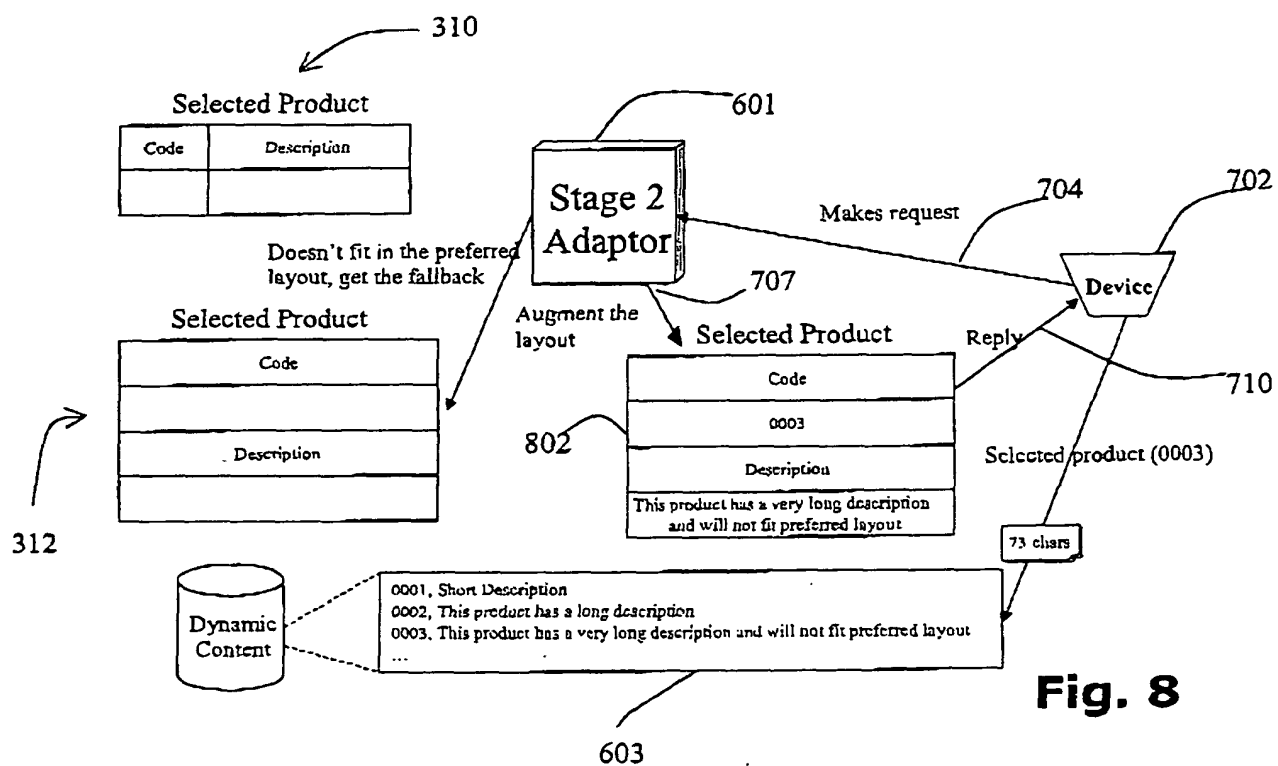
Fig. 2



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**Fig. 3**



**Fig. 8**





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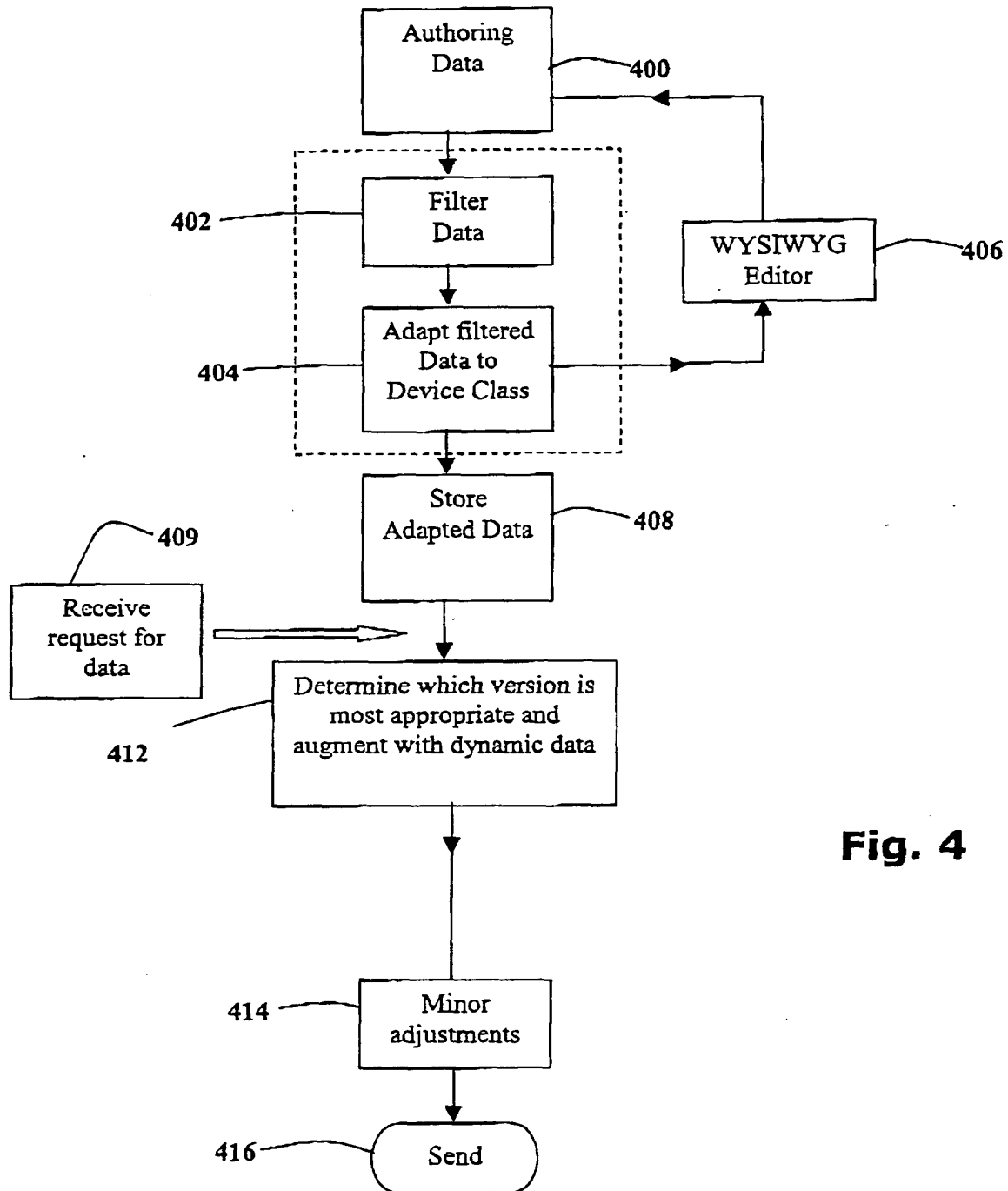


Fig. 4



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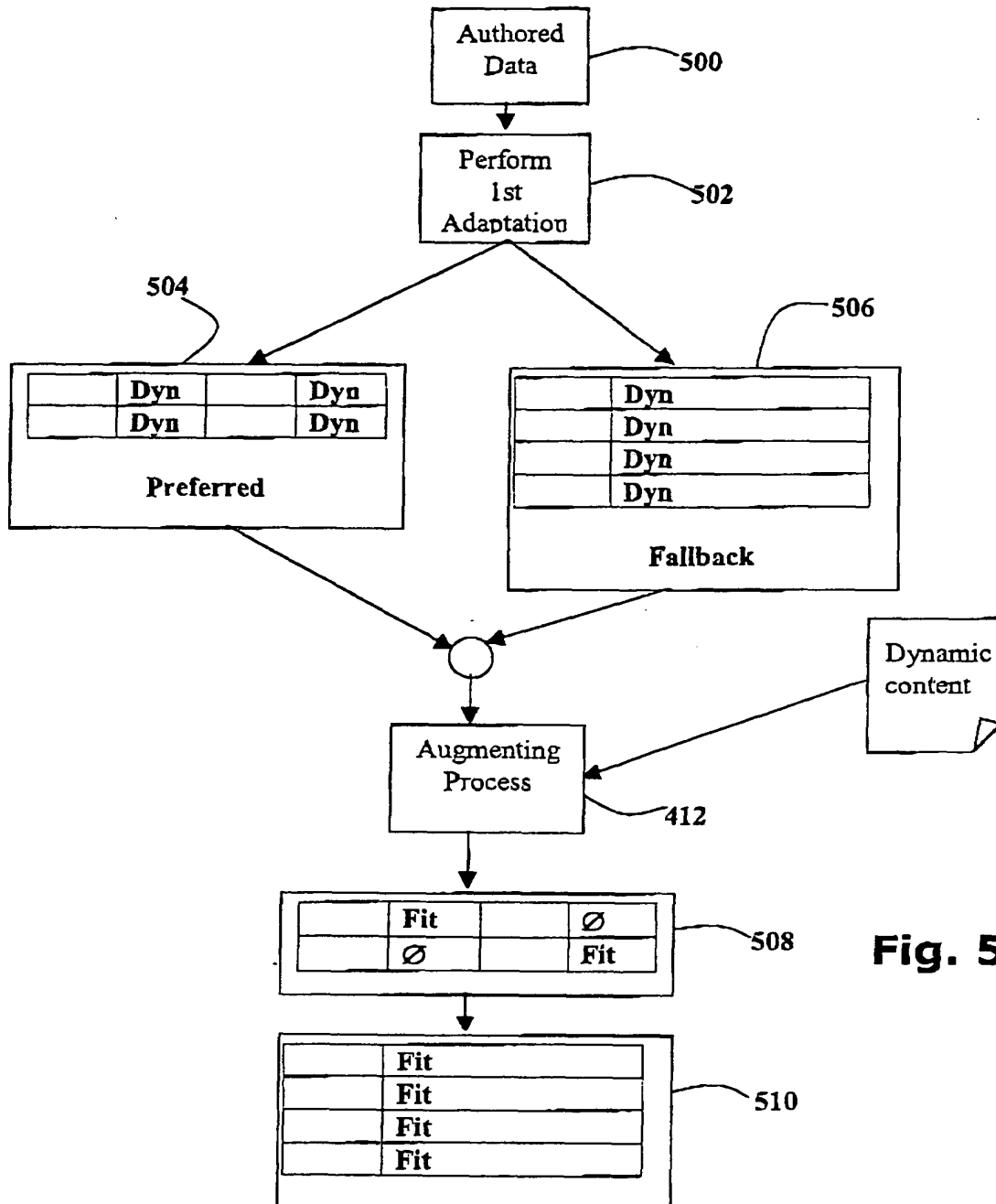
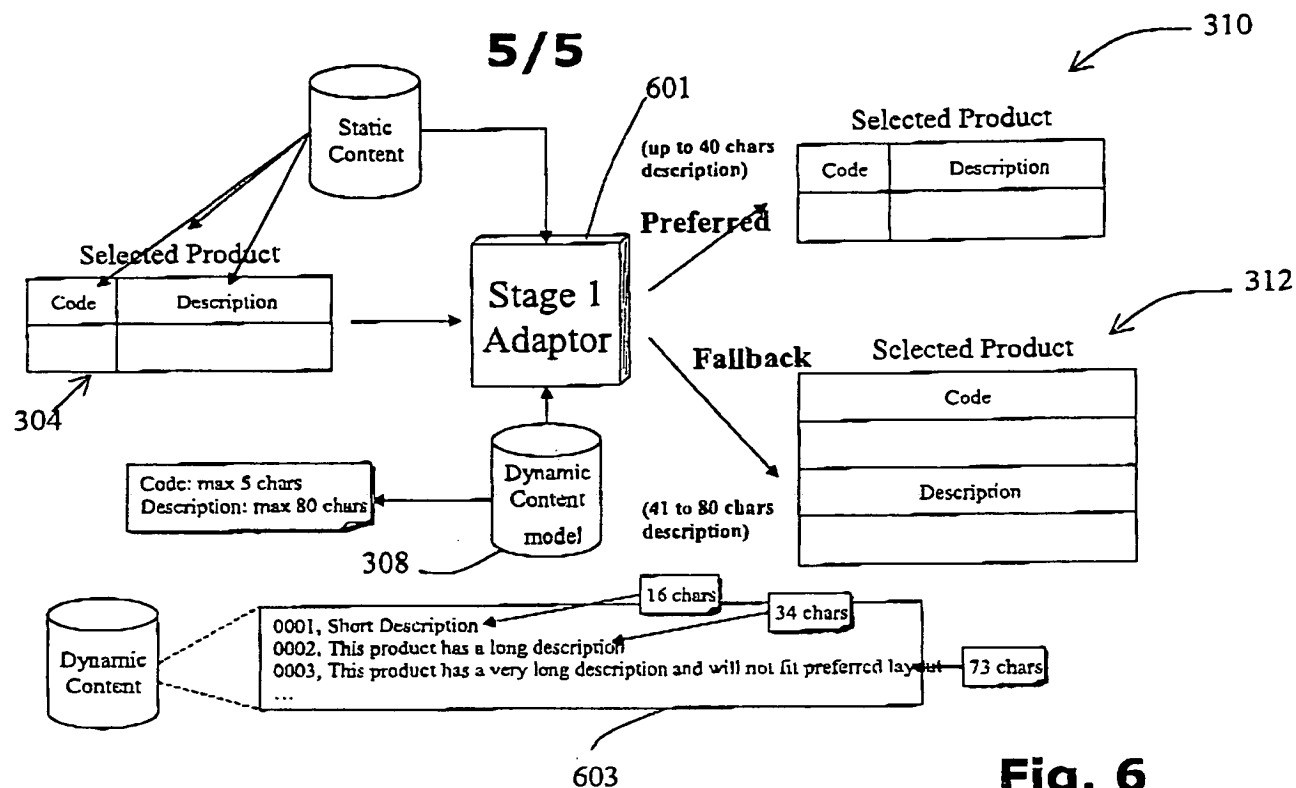
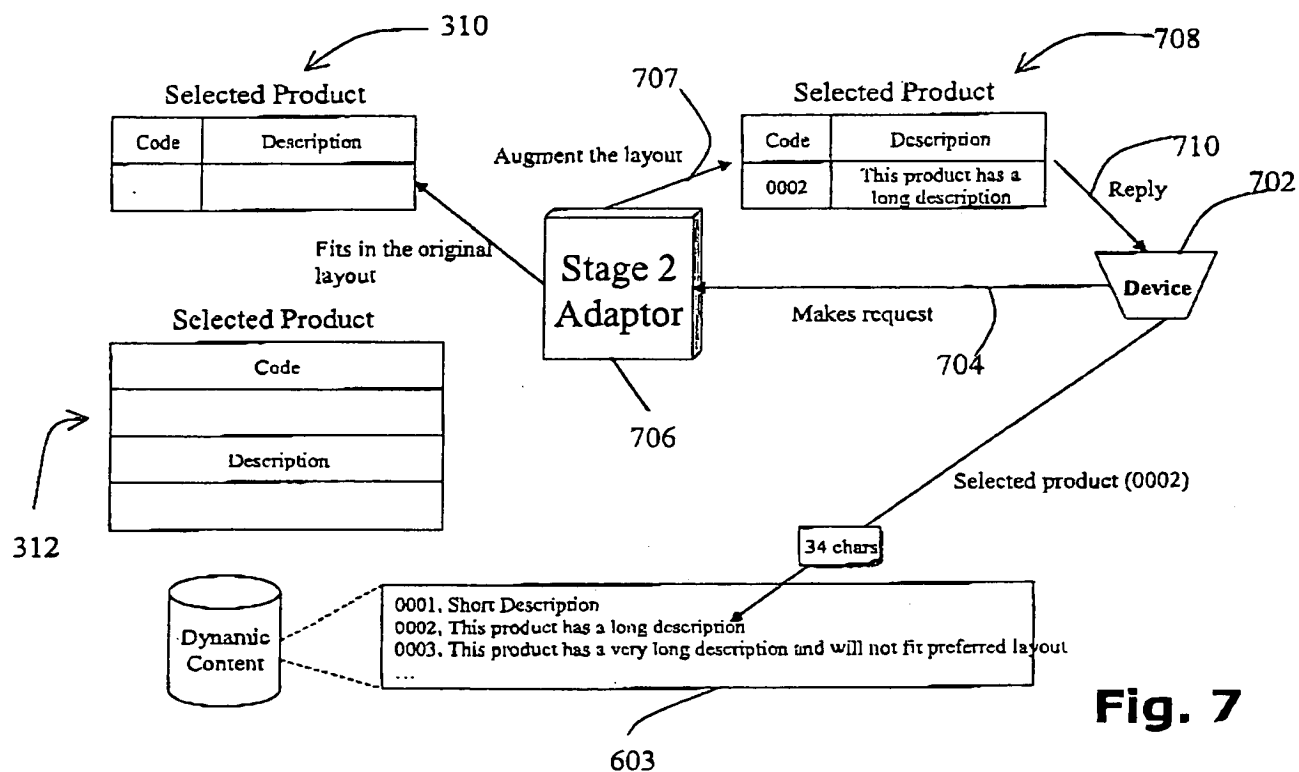


Fig. 5



**Fig. 6****Fig. 7**

